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Fertilizers Take Hold

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A bird's-eye view of the fertilizer situation in the Gopher State

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Like improved livestock, commercial forms of plant food are gradually coming into their own in Minnesota. Wherever they can be used with profit to supplement the farm manure and the legumes grown on the farm, they are finding a welcome. There is no furore about it. The idea of finding out just where fertilizers can be used with profit is spreading in Minnesota, and on a sound basis. Farmers are trying-out the fertilizers, separately and in combinations, and when a farmer finds by the use of small test plots that the added returns will more than pay for the material and the labor of application, he is ready to go ahead.

For this attitude the College of Agriculture of the University of Minnesota is chiefly responsible.

The soils division of the college several years ago began a series of studies which have resulted in what may be called a map of the soil needs of the state. The lines of demarcation of the different needs are not sharply drawn. They could not be. But the broad areas are now clearly indicated, and a farmer in any part of the state is now able to follow a blazed trail. He knows, or can know for the asking, what are the first things in the way of fertilizers which he should try on his particular acres. As a result, ever-increasing numbers of farmers are experimenting with small plots, finding out their soil needs, and then increasing their use of fertilizers.

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Dr. C. O. Rost, in a recent talk to Minnesota farmers, gave a word map of his state's soil needs, in substance as follows:

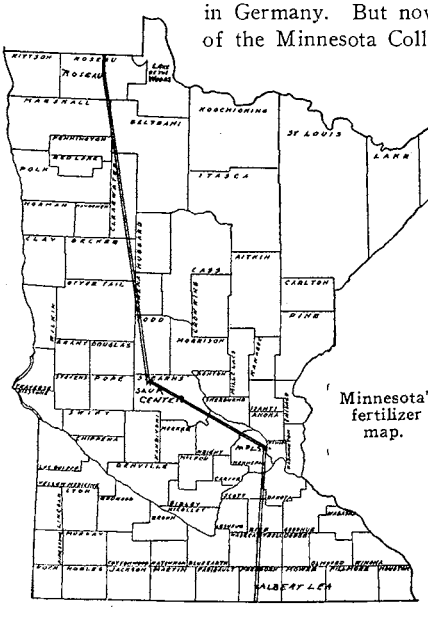
"If you live in southwestern, western, or northwestern Minnesota, that part of the state west of a line from Albert Lea, through the Twin Cities and Sauk Center, to Roseau, where you have black prairie soils mostly, you shou'd try phosphate fertilizer. In that part of the state we have found that phosphate so commonly increases the yield that every farmer ought to try small-scale experiments on his own fields, if he has not already done so. . . . The phosphate should be tried as far as possible on alfalfa, red clover, barley, wheat, and corn.

"If you live in southeastern Minnesota, that is, east of a line running southward from the Twin Cities to the Iowa line, you should also try phosphate. Last year we made trials on 40 fields of corn in that section of the state. On most of these fields the phosphate gave higher yields than any other fertilizer or any fertilizer mixture. It also distinctly hastened maturity. The increase in yields and the hastening of maturity were not so marked as in southwestern, western, and northwestern Minnesota, but were encouraging enough to warrant a trial with phosphate on every farm. Corn, red clover, and barley are the best crops on which to make trials in southeastern Minnesota.

"In northern Minnesota, east of a line from Minneapolis, through Sauk Center, to Roseau, it would be well to confine your trials to a complete fertilizer for ordinary farm crops—other than clover and alfalfa. Try a 2-12-2 mixture, putting it on broadcast at 300-350 pounds to the acre, or at one-half that rate for cultivated crops when an attachment to the planter is used. For potatoes and truck crops, try a 4-8-6 fertilizer, at the rate of 400-500 pounds to the acre broadcast or 300 pounds to the acre with an attachment. For clover and alfalfa try one of the phosphate-potash mixtures, such as 0-10-20 or 0-11-22."

An outline map of Minnesota shows the divisions of Dr. Rost's word picture.

But Dr. Rost's information applies to mineral soils. What about peat soils? Minnesota is the champion peat state of the union. It has 7,000,000 acres of peat, according to estimates. And peat-soil farming is something new under the sun; that is, successful peat-soil farming. It was only 52 years ago that the first attempts were made at the application of science to such farming, and that was in Germany. But now come the people of the soils division of the Minnesota College of Agriculture, saying:



Minnesota's fertilizer map.

"On peat land, wherever the water table can be lowered a few feet below the surface, we can obtain excellent meadows and pastures, with tame grasses and clovers, and these can be made to produce at least as much hay and as much pasturage as the best loams or clay loams. Peat also *can be made* to produce good yields of hardy vegetables—those that can withstand summar frosts, such as carrots, cabbages, and turnips. It can be made also to give high yields of potatoes of excellent quality, when summer frosts do not interfere. Winter rye can usually be made to do well and oats and barley often give good yields."

But notice that "can be made."

Peat, near Anoka, Minn., without fertilizer—potatoes, 27 bushels an acre; corn 6 tons of silage an acre.

Don't get the idea, however, that peat lands can be made to produce as indicated simply by applying methods and practices which have proved successful on upland soils. You have to introduce something else. It may be lime, it may be phosphate, it may be potash, or it may be mixtures. Rarely is it nitrogen. But among Minnesota's peat lands, most fields need both phosphate and potash.

The thing to do here, again, is to try-out the peat. The first step—even before drainage is installed—is to find out, by taking samples according to directions and having them examined in the chemical laboratory of the soils division at the College of Agriculture, whether it is high-lime or low-lime peat. The next step is to find out what fertilizer is needed.

The state is not mapped for peat-land needs in the way it is mapped for mineral soils needs. Peat soils are more uncertain. However, it is not difficult to determine what the needs are in any particular field, and the farmers of Minnesota, having learned that this can be done, are doing it. The number of men farming these peat soils is steadily increasing. For example, in Anoka county just north of Minneapolis and St. Paul in 1919 no one except the University of Minnesota was trying to farm peat, and the university was trying as a means of finding out for the rest of the state. In 1920 one farmer undertook to follow the university's lead. In 1922 about 40 farmers were at peat-land farming; in 1923, 200; and now it is estimated that the number is at least 700.

Two pictures shown herewith show what can be done. The one picture, a corn field in the background and potatoes in front, shows the kind of results obtained without fertilizing. The other picture shows what phosphate and potash can do in the same locality.

With information such as has been accumulated by the soils division, the conquest of the state — both of mineral and of peat soils — is going forward, and the College of Agriculture is pointing the way, or better, is leading the charge. Mem-

Peat, near Anoka, Minn., with phosphate and potash—potatoes, 320 bushels an acre; corn 24 tons of silage an acre.

bers of the staff, specialists in the extension service, county agents, bulletins, and the college news bureau are carrying the good news into every corner of the state. The staff of the soils division is giving ocular demonstrations through the establishment of experimental fields in many parts of the state and by lectures reinforced with striking photographs. It takes a rather obstinate farmer to resist the evidence of such displays.

Extension specialists and county agents can now talk with confidence as to soil needs, whatever part of the state they may be in. They can, at least, tell the farmer just how to find out what his soil needs are, and can help him to find out. Bulletins issued by the extension service and the news bureau supplement verbal messages.

Corn is now king in Minnesota. Corn has displaced wheat on the throne. A new bulletin issued by the extension service advises farmers to try phosphate in those parts of the state where the soils specialists have found that phosphate is usually attended by increased yields and earlier maturity.

Next to corn in Minnesota comes hay. The state has nearly 4,500,000 acres of land in hay annually, and the hay-maker is being encouraged to grow more and more alfalfa. Dr. Rost tells farmers in western Minnesota, over nearly half the state, to try phosphates on their alfalfa fields.

Potatoes are another great crop in Minnesota. For seven years Minnesota has had the largest potato acreage of any state in the Union, and for three of those years it has produced more potatoes than any other state. Forth comes a bulletin on potato growing to tell the grower to try 4-8-6 or 2-8-5 on mineral soils or various combinations of phosphate and potash on peat soils.

The fertilizer idea *has* taken hold in Minnesota. It has stirred up no fever or high blood pressure, but it has taken hold. It is being developed with sanity and sound judgment both by the leaders and the followers—the farmers. The result ought to be beneficial, and it will be.

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